



Dental Caries Status of 3-6 Years Old Children in Biratnagar, Nepal: A Cross-Sectional Study

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ABSTRACT

Background: Dental caries persists as one of the most prevalent chronic diseases among children worldwide. In preschool age children, this form of dental caries is termed as Early Childhood Caries (ECC). The objective of this study is to determine the frequency of dental caries among preschool children of Biratnagar, Nepal.

Methods: A cross-sectional study of 1382 preschool children was conducted in Biratnagar, Nepal. Children were randomly selected from government run preschools in Biratnagar. Children between 3-6 years age group were assessed for dental caries. Data was analyzed using SPSS version 16.0 software.

Results: Out of the 1382 children examined, 894(64.86%) had caries out of which 501(56.04%) were males and 393(43.95%) females. The overall mean deft for ECC was 2.93 ± 2.17 ranging from 0-16. Severe-ECC was present in 39.59% (354 out of 894) of caries positive children. Dental plaque was present in 931(67.36%) children. 279(20.18%) children had poor oral hygiene.

Conclusion: More than half of the preschool children had early childhood caries. Association between age of the child, dental plaque and poor oral hygiene has been established. There is an urgent need for preventive and curative oral health programs for children in Nepal.

Key Words: Dental caries, Preschool children, ECC, s-ECC, Nepal

INTRODUCTION

Dental caries persists as one of the most prevalent chronic diseases among children worldwide. Dental caries also interferes with the healthy life of both children and adolescents. Dental caries is defined as a multifactorial microbial disease characterized by demineralization of the inorganic and destruction of the organic substance of the tooth.^[1] Dental caries in preschool age children is termed as Early Childhood Caries (ECC). According to American Academy of Pediatric Dentistry (AAPD), ECC is defined as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in a child 71 months of age or younger. In children younger than 3 years of age,

any sign of smooth surface caries is indicative of severe early childhood caries (s-ECC).^[1, 2]

Children with ECC and s-ECC have a poor quality of life due to pain, premature loss of teeth, malnutrition, distress and functional restrictions.^[3] The incidence of dental caries among preschool children of developed countries has been declining. However, 90% of preschool children in Asia are affected by dental caries.^[4] There is a lack of definite data on incidence of ECC and s-ECC at both national and local levels in the city of Biratnagar, Nepal. Therefore the aim of the present study is to measure the incidence of dental caries among 3-6 years old children of Biratnagar, Nepal.

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METHODS

A cross sectional study was conducted in Biratnagar, Nepal during the period of Jan-April, 2018. The study was conducted after approval from institutional ethical review committee. Informed consent explaining the nature of the study was obtained from the parents and headmasters of the schools. 3-6 years old children of both genders from government run preschools were included in the study. Children above 6 years of age having at least one permanent tooth or suffering from periodontal conditions or any systemic disease or were absent on the day of examination were excluded from the study.

A total of 1382 children attending government run preschools were clinically examined for diagnosis of ECC and s-ECC according to deft index. The WHO criterion was used for diagnosis of dental caries.^[4] The presence of dental plaque and assessment of oral hygiene was assessed solely through visual examination without using any universally accepted index system as it was not the prime objective of the study.

Caries severity was assessed via deft index by categorizing the score into very mild (1 tooth), mild (2-3 teeth), moderate (4-5 teeth) and severe (more than 6 teeth). The examination of the children was done by single calibrated examiner with the child seated in a normal chair or in knee to knee position depending on the behavior of the child. The examination was carried out using sterilized mouth mirror and explorer in natural light. In questionable cases the tooth was marked as sound. No radiographs were taken.

SPSS version 16.0 software was used to enter and analyze the data. Chi-square test and ANOVA were used to find significance. P value of <0.05 was considered as statistically significant.

RESULTS

Out of the 1382 children examined, 719 (52.02%) were boys and 663 (47.97%) were girls. The overall prevalence of caries in the study population was 64.68% (894 children). Out of the 894 (100%) children with ECC, 56.04% (501) were boys and 43.95% (393) were girls [see Table No.1]. No significant differences were observed in ECC affected children based on gender ($P = 0.31$). Whereas prevalence of ECC was significantly higher among 3-4 years children as compared to other age groups ($P = 0.001$).

Out of the 51% children with ECC, 39.59% (354 children) had s-ECC out of which 54.23% (192) were boys and 45% (162) were girls. No significant gender difference was found ($P = 0.47$) [see Table 2]. There was also no significant difference among different age groups ($P = 0.44$).

The overall mean deft score was 2.93 (± 2.17) of which decayed component comprised of 1.87 (± 2.73), extracted component 1.12 (± 0.61) and filled component only 0.79 (± 0.213). The mean deft of boys was 3.18 (± 3.02) and girls was 2.63 (± 2.54) [see Table 3].

Out of the 1382 children examined 27.06% had one tooth involved (very mild), 11.79% had 2-3 teeth involved (mild), 14.83% had 4-5 teeth involved (moderated) and only 10.99% had more than 6 teeth affected (severe). Dental plaque was clearly visible in 67.36% children and 20.18% children had poor oral hygiene [see Table 4].

DISCUSSION

A total of 1382 children aged 3-6 years were examined for ECC from various government run preschools in and around Biratnagar. The statistics of this study revealed that almost 65% of 3-6 years old children suffered from ECC which is way below the WHO goals i.e. 50% of the preschool children should be caries free.^[5] This is high compared with neighboring countries where the prevalence of ECC ranges from 37.64-52.31% in India to 43.01-51.4% in China. The highest prevalence of ECC was 85.5% in rural china.^[6,7,8] These could be attributed to differences in socio-economic, cultural, nutrition, dietary habits and oral hygiene patterns. The prevalence of ECC worldwide was found to be highly variable ranging from 11-53.1% in USA, 6.8-12% in UK to 2.1% in Sweden.^[9-14] This could be due to differences in case definitions and diagnostic criteria

An important finding of this study was that about 39.59 % of children with ECC showed s-ECC. Only 3.9% of all decayed teeth were filled whereas 1.2% primary teeth were extracted due to caries. Another important finding of this study was that all the children with ECC showed untreated dental caries and required treatment. This proves a lack of awareness about oral health among parents and government bodies. Also, lack of affordability for oral health in this section of society is alarming.

Most children (79.81%) maintained a good oral hygiene, whereas plaque accumulation was observed in 67.36% of children examined.

In the present study, there could be a slight overestimation of caries experience. As the study was carried out at only government run preschools, all the children belong to poor families who have been proved to give least importance to oral health.

CONCLUSION

64.68% of government run preschool children bear the burden of dental caries. There is an urgent need for implemen-

tation of government aided, NGO aided and public-private partnership dental health treatment programs.

Since this was a cross-sectional study, therefore a future longitudinal study is suggested to establish association for risk factors with dental caries in Nepal.

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Table 1: Gender and age wise prevalence of ECC

	Age in years									Total
	3-4			4-5			5-6			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
N	319	273	592	269	256	525	131	134	265	1382
ECC(N)	231	202	433	198	134	332	72	57	129	894
ECC(N%)	72.41	74	73.1	73.61	52.3	63.23	54	42.53	48.67	64.68

Table 2: Age and Gender wise prevalence of s-ECC

	Age in years									Total
	3-4			4-5			5-6			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
N	231	202	433	198	134	332	72	57	129	894
s-ECC(N)	92	67	159	73	79	152	27	16	43	354
s-ECC(N%)	39.82	33.16	36.72	36.86	58.95	45.78	37.5	28.07	33.33	39.59

Table 3: distribution of variables regarding dental caries status and cumulative dmft

Variables	Frequency (N=1382)	Percent	Mean \pm SD
deft(cumulative)	894	64.68	2.93 \pm 2.17
Decayed	881	63.74	1.87 \pm 2.73
Extracted(due to caires)	17	1.2	1.12 \pm 0.61
Filled	54	3.9	0.79 \pm 0.213

Table 4: Severity of dental caries and status of oral health

Variables	Frequency (N=1382)	Percent
Dental caries status:		
Caries positive	894	64.68
Caries negative	488	35.31
Decayed category for severity		
0(sound)	488	35.31
1(1 tooth involved)	374	27.06
2(2-3 teeth involved)	163	11.79
3(4-5 teeth involved)	205	14.83
4(6+teeth involved)	152	10.99
Presence of Dental Plaque		
Yes	931	67.36
No	451	32.63
Poor Oral Hygiene		
Yes	279	20.18
No	1103	79.81